

AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

1. (CURRENTLY AMENDED) A magnetic head having an air bearing surface (ABS), comprising:
an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer;
a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned; and
a free layer positioned between the AP pinned layer structure and the bias layer; wherein at least one of the pinned layers extends at least about 0.1 microns beyond ~~track edges~~ ~~each track edge~~ of the free layer in a direction parallel to the ABS.

2. (CURRENTLY AMENDED) A magnetic head as recited in claim 1, having an air bearing surface (ABS), comprising:
an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer;
a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned; and
a free layer positioned between the AP pinned layer structure and the bias layer; wherein at least one of the pinned layers extends beyond track edges of the free layer in a direction parallel to the ABS,

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wherein the pinned layer positioned closest to the free layer does not extend beyond the track edges of the free layer.

3. (CURRENTLY AMENDED) A magnetic head as recited in claim 1, further comprising having an air bearing surface (ABS), comprising:
an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer;
a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned;
a free layer positioned between the AP pinned layer structure and the bias layer, wherein at least one of the pinned layers extends beyond track edges of the free layer in a direction parallel to the ABS, and
at least one antiferromagnetic (AFM) layer positioned outside the track edges of the free layer in a direction parallel to the ABS, each AFM layer being for pinning a magnetic orientation of portions of the pinned layer positioned outside the track edges of the free layer.
4. (CURRENTLY AMENDED) A head as recited in claim [[1]] 3, wherein each of the pinned layers extends beyond the track edges of the free layer.
5. (CURRENTLY AMENDED) A magnetic head as recited in claim 1, further comprising having an air bearing surface (ABS), comprising:
an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer;
a bias layer spaced apart from the AP pinned layer structure, a magnetic moment of the bias layer being pinned;
a free layer positioned between the AP pinned layer structure and the bias layer;

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wherein at least one of the pinned layers extends beyond track edges of the free layer in a direction parallel to the ABS, and

at least one antiferromagnetic (AFM) layer positioned outside the track edges of the free layer in a direction parallel to the ABS, each AFM layer being for pinning a magnetic orientation of portions of the pinned layer closest thereto and positioned outside the track edges of the free layer.

6. (CURRENTLY AMENDED) A head as recited in claim [[1]] 5, wherein the head forms part of a GMR head.
7. (CURRENTLY AMENDED) A head as recited in claim [[1]] 5, wherein the head forms part of a CPP GMR sensor.
8. (CURRENTLY AMENDED) A head as recited in claim [[1]] 5, wherein the head forms part of a CIP GMR sensor.
9. (CURRENTLY AMENDED) A head as recited in claim [[1]] 5, wherein the head forms part of a tunnel valve sensor.
10. (CURRENTLY AMENDED) A magnetic head having an air bearing surface (ABS), comprising:
an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer; and
a free layer positioned towards the AP pinned layer structure;
wherein at least one of the pinned layers extends at least about 0.1 microns beyond track edges each track edge of the free layer in a direction parallel to the ABS.

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11. (CURRENTLY AMENDED) A magnetic head as recited in claim 10, having an air bearing surface (ABS), comprising:
an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer; and
a free layer positioned towards the AP pinned layer structure;
wherein at least one of the pinned layers extends beyond track edges of the free layer in a direction parallel to the ABS,
wherein the pinned layer positioned closest to the free layer does not extend beyond the track edges of the free layer.
12. (CURRENTLY AMENDED) A magnetic head as recited in claim 10, further comprising having an air bearing surface (ABS), comprising:
an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer;
a free layer positioned towards the AP pinned layer structure;
wherein at least one of the pinned layers extends beyond track edges of the free layer in a direction parallel to the ABS, and
at least one antiferromagnetic (AFM) layer positioned outside the track edges of the free layer in a direction parallel to the ABS, each AFM layer being for pinning a magnetic orientation of portions of the pinned layer positioned outside the track edges of the free layer.
13. (ORIGINAL) A head as recited in claim 10, wherein each of the pinned layers extends beyond the track edges of the free layer.
14. (CURRENTLY AMENDED) A magnetic head as recited in claim 10, further comprising having an air bearing surface (ABS), comprising:

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an antiparallel (AP) pinned layer structure having at least two pinned layers with magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer;
a free layer positioned towards the AP pinned layer structure;
wherein at least one of the pinned layers extends beyond track edges of the free layer in a direction parallel to the ABS, and
at least one antiferromagnetic (AFM) layer positioned outside the track edges of the free layer in a direction parallel to the ABS, each AFM layer being for pinning a magnetic orientation of portions of the pinned layer closest thereto and positioned outside the track edges of the free layer.

15. (ORIGINAL) A head as recited in claim 10, wherein the head forms part of a GMR head.
16. (ORIGINAL) A head as recited in claim 10, wherein the head forms part of a CPP GMR sensor.
17. (ORIGINAL) A head as recited in claim 10, wherein the head forms part of a CIP GMR sensor.
18. (ORIGINAL) A head as recited in claim 10, wherein the head forms part of a tunnel valve sensor.
19. (CURRENTLY AMENDED) A magnetic storage system, comprising:
magnetic media;
at least one head for reading from and writing to the magnetic media, each head having:
a sensor having the structure recited in claim [[1]] 3;
a write element coupled to the sensor;

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a slider for supporting the head; and
a control unit coupled to the head for controlling operation of the head.

20. (CURRENTLY AMENDED) A magnetic storage system, comprising:
magnetic media;
at least one head for reading from and writing to the magnetic media, each head
having:
a sensor having the structure recited in claim 40 5;
a write element coupled to the sensor;
a slider for supporting the head; and
a control unit coupled to the head for controlling operation of the head.

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